

APPLICABILITY DETERMINATION GUIDELINES

S.C. LOWEST ACHIEVABLE EMISSION RATE (LAER) REGULATION

APPLICABLE TO VOLATILE ORGANIC COMPOUNDS

July 1, 1997

I. Introduction

Determining a facility's status with regard to LAER applicability is an initial step in permitting Volatile Organic Compound (VOC) emitting processes. Undergoing this determination normally assumes there is an increase in VOC emissions at the facility. Complicating this procedure, VOC emissions may vary greatly due to production and equipment changes. Further, VOC production and usage data for the baseline year of 1978 may not be available. If the facility was built after 1979, the initial VOC emission rates should have been submitted as part of the permitting process at that time.

These guidelines address how LAER applicability determinations are performed and identifies how complex determinations can be simplified.

II. Standard Applicability Determinations for Pre-1979 Facilities with Complete Records

A. Discussion

1. VOC emissions data, for the year 1978, are used to determine the baseline emission rate. This rate, in tons per year, should reflect the best efforts to identify the facility's total actual VOC emissions. These records may include material makeup and yearly usage, control device efficiencies, amounts and makeup of material disposed as waste, etc. It is important to remember that facilities may have used higher VOC containing products in earlier years. VOC emissions have been reduced by facilities continuing to use materials containing a lower VOC content. This difference in VOC content may result in a higher than expected VOC calculation.

The VOC definition has changed over time resulting in additions or deletions of exempted compounds. These revisions need to be considered with each new construction or modification project. If the facility was built after 1979, it is assumed that the initial VOC emission rates were submitted as part of the permitting process and that a LAER applicability determination was made at that time.

2. Emissions data from each subsequent year are compiled as was done for the baseline or first year of operation. This will document any decreases and increases which may affect the status of the facility. This will also account for changes where LAER should

have been applied in the past. Any emissions subject to a prior LAER determination should not be counted in any of these totals. If the increase in total VOC actual emissions which have not been subject to LAER exceeds 100 tons, LAER applies.

3. Proposed new construction or modifications should be reviewed for total VOC actual emissions based on maximum actual emissions considering permit limitations. When the total of the existing VOC actual emissions (excluding previous LAER sources) plus the proposed VOC emissions increase exceed 100 tons per year, LAER applies. Unless measures are taken to decrease the total actual emissions (excluding previous LAER sources) to less than 100 TPY, only those sources of proposed increased VOC emissions are subject to LAER. After LAER is applied to those sources, their VOC emissions will no longer be counted in future LAER applicability determinations.

B. Example

Figure 1 provides an example of a LAER applicability determination in a case where information is complete.

FIGURE 1

LAER APPLICABILITY DETERMINATION

<u>Date</u>	<u>Activity</u>	<u>Plus/minus VOC emissions (TPY)</u>	<u>VOC Total emission (TPY)</u>	<u>Net VOC increase for LAER (TPY)</u>
1978	facility		134.80	0.00
1979			135.00	0.20
1980			135.00	0.20
1981			134.80	0.00
1982	line taken out	-2.40	132.40	-2.40
1983			135.00	0.20
1984			140.00	5.20
1985			139.00	4.20
1986	oven out	-0.03	132.30	-2.50
	unit #1 out	-50.40	81.90	-52.90
1987	unit #2 out	-25.50	56.40	-78.40
1988	tenter coating in	+1.90	58.30	-76.50
1989	finishing unit out	-50.40	8.08	-126.72
1990			8.05	-126.75
1991	laboratory in	+0.03	8.89	-125.91
1992	painting in	+0.30	9.19	-125.61
1993	painting up	+26.80	37.40	-97.40
1994	painting up	+18.10	55.50	-79.30
1995	proposed actual emissions after modifications: (55.5 TPY existing, additional 170 TPY from expanded operations)		225.50	90.70

C. Preceding Figure 1 Example Conclusion

In the above example, LAER would not apply because the net VOC increase of 90.7 TPY (225.5 TPY - 134.8 TPY) is less than the LAER trigger of 100 TPY.

If the increase in the above example had triggered LAER, those modifications causing the VOC increase may be subject to a LAER determination as described in the examples provided in Section V of these guidelines.

III. LAER Applicability Determinations for Pre-1979 Facilities with Incomplete Records

A. Discussion

1. The most common problem in determining VOC emission rates is missing information. Production records may be missing or formulations may be unavailable. These situations will be addressed on a case-by-case basis. The facility and the Bureau of Air Quality should work closely together to ensure acceptable emissions calculations.

2. The baseline emission rate determination is the first and most important part of the applicability process. If data are missing, it may be necessary to use data from some year with similar production to estimate emissions.

3. Once the baseline is established, the facility should determine if a proposed project would be subject to a LAER review. This is done by subtracting the baseline from the total VOC actual emissions rate, including any proposed increases. If the result is greater than or equal to 100 TPY, LAER applies.

B. Example

Figure 2 provides an example of an abbreviated determination for a facility in operation prior to 1979 and for which production records or data is incomplete.

FIGURE 2

**SIMPLIFIED LAER DETERMINATION
(PRE-1979 FACILITY WITH INCOMPLETE DATA)**

<u>Date</u>	<u>Activity</u>	<u>VOC Total emissions (TPY)</u>	<u>Net VOC increase for LAER, TPY</u>
1978	baseline determination	125	0
1995	existing facility emissions	145	20
1996	proposed total facility emissions (90 TPY additional VOC emissions from new process)	235	110

C. Preceding Figure 2 Example Conclusion

In the above example, LAER applies since there is a 110 TPY (235 TPY - 125 TPY) increase over the 1978 baseline year.

IV. LAER Applicability Determinations for Post-1979 Facilities

A. Discussion

A simplified determination is similar for a facility starting operations after 1979. Since there is no existing VOC baseline, all VOC emissions since start-up count toward LAER applicability.

B. Example

Figure 3 provides an example of a post-1979 facility determination.

FIGURE 3

**SIMPLIFIED LAER DETERMINATION
(POST-1979 FACILITY)**

<u>Date</u>	<u>Activity</u>	<u>VOC Total emissions (TPY)</u>	<u>Net VOC increase for LAER, TPY</u>
1984	facility startup	85	85
1995	facility emissions (increase of 5 tons per year)	85 + 5	90
1996	proposed total facility emissions (90 TPY additional VOC emissions from new process)	90 + 90	180

C. Preceding Example Figure 3 Conclusion

In the above example, LAER applies since there is a net increase in VOC emissions of over 100 TPY.

V. Examples of Possible LAER Determination Situations

There are five scenarios that cover most of the actual VOC emission increase situations that are subject to LAER. These are shown as follows:

A. Scenario One: Additional equipment triggers a LAER Review

FIGURE 4

ADDITIONAL EQUIPMENT

<u>Date</u>	<u>Activity</u>	<u>VOC Total emissions (TPY)</u>	<u>Net VOC increase for LAER, TPY</u>
1982	line #1 added	+50	50
1984	line #2 added	+40	90
1996	line #3 added	+30	120

1. In this scenario new equipment is to be added in 1996 that will cause a facility to have a net VOC emissions increase above 100 tons per year. None of the processes in this net VOC emissions increase have been subject to a LAER review. In Figure 4, adding line #3 in 1996 increases the VOC emissions of the facility above 100 tons per year triggering a LAER review.

2. A facility may preclude LAER being triggered by placing controls or limits that would keep the net VOC emissions increase under 100 tons per year. These controls or limits may be placed on the old lines, the new lines, or a combination of both; any combination that allows the facility to stay below the 100 tons per year threshold is appropriate. These reduced VOC emissions would still count toward the 100 tons per year LAER threshold for future increases unless the controls or limits applied constitute LAER level controls at the time of the review and are permitted as such.

3. A second option would be to apply LAER only to line #3. Line #3 emissions would be removed from consideration for future LAER applicability determinations. The facility's net VOC emissions increase from line #1 and #2 would still be 90 tons per year; emissions from any future expansion would be added to the 90 tons and if the total is over 100 tons per year, a LAER review would be required.

4. A third option is to determine the amount of emissions decrease which would result from the application of LAER to proposed line #3. Controls on any combination of proposed and/or existing lines which result in an equivalent reduction would satisfy the LAER requirements. This approach would be considered an alternative to applying LAER, but could result in greater than 100 tons per year of VOC emissions. Limits for all lines involved in the emissions reductions will become enforceable permit conditions. These emission limits would not be considered LAER on the issued permits but would reflect emissions which allowed the source to avoid a LAER review. Any new proposed increases in emissions at the facility will trigger a LAER applicability determination counting emissions from the baseline or first year of operation. In this example, LAER for line #3 would be 15 tons per year, so if line #1 and #2 could be reduced to 40 and 35 tons per year, respectively, then the LAER emission requirement for this facility would be satisfied and line #3 would avoid a LAER review.

5. Considering future growth, it may be beneficial to apply LAER plant wide or on some combination of sources at the facility. In the second approach, line #1 and #2 would still be contributing 90 tons per year to the net VOC emissions increase after LAER is applied to line #3. If LAER were also applied to all three lines, the facility's net VOC emissions increase would be reset to 0 tons per year. Future increases in emissions would have to equal or exceed 100 tons per year to trigger additional LAER requirements.

B. Scenario Two: Increase in emissions without additional equipment triggers LAER review

FIGURE 5

INCREASE IN EMISSIONS WITHOUT INSTALLING ADDITIONAL EQUIPMENT

<u>Date</u>	<u>Activity</u>	<u>VOC Total emissions (TPY)</u>	<u>Net VOC increase for LAER, TPY</u>
1982	line #1 added	+50	50
	line #2 added	+40	90
1996	line #1 increased	+20	110
	line #2 increased	+20	130

1. In this example a facility proposes to increase emissions through a production increase, product change, etc. This change will cause the net VOC emissions increase to exceed 100 tons per year. As in the first example, an approach to preclude LAER being triggered would be to control or limit VOC emissions to less than 100 tons per year. These reduced VOC emissions would still contribute toward the 100 tons per year threshold if LAER controls or limits are not applied.

2. A second option would allow a source or set of sources to emit up to, but less than, 100 tons per year and require the remaining sources to have LAER controls. The VOC emissions from the sources without LAER controls would still contribute to the net VOC emissions increase. Any future expansion netting over 100 tons per year would be subject to a LAER review.

3. A third option is application of LAER on all sources at the facility. This option would eliminate these VOC emissions from future LAER applicability determinations and provide the facility the most flexibility for future growth.

C. Scenario Three: Increases at a Pre July 1, 1979 Facility

1. This scenario involves a facility with VOC emissions prior to July 1, 1979 that plans to install new equipment and/or modify existing operations such that the total VOC emissions increase above the baseline will be greater than 100 tons per year. The facility may elect to reduce its baseline emission rate to avoid the new emissions from triggering LAER. This reduction may be obtained through controls or limits on the existing processes. These controls or limits do not have to meet LAER requirements. Reductions may also be realized by taking credit for emissions sources that were included in the baseline emission rate but have since been removed.

2. The amount of VOC emissions increases at the facility, which would trigger a LAER review, would be their baseline emission rate plus 100 tons per year. If this facility plans to increase emissions which would trigger a LAER review, the options shown in Scenario One (Additional equipment) or Scenario Two (Emissions increase without additional equipment) would be available control possibilities. See the Determination of LAER Applicability section for additional information on the netting process.

D. Scenario Four: VOC definition change or compound addition causes facility emissions to become greater than 100 tons per year with no physical or operational change at the facility

1. This scenario involves a facility with existing emissions that a VOC definition change causes the facility's emissions to increase above the 100 ton per year threshold for LAER. No actual net VOC increase occurs because there was no physical or operational change. However, an adjustment to the baseline will be established during any future LAER applicability review. Any future increase resulting from a physical or operational change would be considered a net VOC increase subject to a LAER applicability determination.

2. This scenario also addresses regulatory changes that add compounds to the VOC definition.

FIGURE 6

INCREASE IN VOC EMISSIONS DUE TO DEFINITION CHANGE

<u>Date</u>	<u>Activity</u>	<u>VOC Total emissions (TPY)</u>	<u>Net VOC increase for LAER, TPY</u>
1982	Line #1 and Line #2 installed (only Line #1 subject to VOC definition)	+40	40
1990	VOC definition change Line #2 subject to definition	+80	40
1996	Line #3 addition 1996 VOC emissions are 140 TPY, but 60 TPY for LAER determination	+20	60

1. In this example a facility was built after 1979. Line #1 had VOC emissions of 40 tons per year and Line #2 had VOC emissions of 80 tons per year. Line #2 did not

have actual VOC emissions because of the VOC definition in existence at the time. A change in definition made the second line's emissions count toward the facility's total VOC emissions, bringing the facility's actual VOC emissions to 120 TPY. However, the additional 80 TPY of VOC (if properly documented) is not counted in any LAER determinations since it was not originally counted in 1979 and is only now considered a VOC because of the definition change.

2. The 80 TPY emissions will be considered as pre-1979 emissions. This will allow for its control as a possible creditable decrease. Any future increases or decreases from this line will be counted towards LAER applicability determinations.

3. The addition of Line #3, with 20 TPY VOC emissions, will not trigger LAER because the facility has not yet exceeded 100 TPY VOC for LAER purposes.

E. Scenario Five: Facility has existing permit requiring VOC controls and wishes to add new equipment

1. **Example A:** A facility has a LAER permit that allows greater than 100 tons per year emission rate of VOCs plant wide, and a new source will cause a net VOC emissions increase of less than 100 tons per year.

Emissions from a source that has received a LAER permit are not counted towards the 100 tons per year LAER threshold. LAER would not be triggered with the addition, but the emissions from the new source will contribute to the 100 tons per year LAER threshold in future applicability determinations.

2. **Example B:** A facility has a LAER permit that allows less than 100 tons per year emission rate of VOCs, and a new source will cause a net VOC emissions increase of less than 100 tons per year.

Emissions from sources that have received a LAER permit are not counted toward the 100 tons per year LAER threshold. LAER would not be triggered with the addition, but the emissions from the new source will contribute to the 100 tons per year LAER threshold in future applicability determinations.

3. **Example C:** A facility has an NSPS permit that controls VOCs to less than 100 tons per year and plans to add a new line that will cause a net VOC emissions increase of greater than 100 tons per year.

This example is the same as Scenario One (Additional Equipment). The only difference is that the existing equipment is already subject to NSPS controls.

VI. Fugitive VOC Emissions in LAER Determinations

The Bureau utilizes the rationale of the New Source Review/Prevention of Significant Deterioration "fugitive emission" definition in determining what is considered a fugitive VOC emission. Fugitive emissions are those which cannot be captured or contained by reasonable methods. If a VOC emission can reasonably be passed "through a stack, chimney, vent, roof monitor, or other functionally equivalent opening," then it would not be considered a fugitive emission. For example, VOC emissions from residual coatings on products stored in a warehouse cannot be reasonably captured and are therefore considered fugitive emissions. Alternatively, VOC emissions from an emission source that can be reasonably captured and vented would not be considered a fugitive emission source. VOC emissions not captured due to inefficient or missing capture equipment will not be considered fugitive emissions. Providing a specific VOC emission meets this strict definition of "fugitive emission", the Bureau will not consider the emission in making a LAER applicability determination.

"Reasonable" methods of capture or containment is defined by what is presently preferred in the RACT/BACT/LAER Clearinghouse (RBLC), a State Implementation Plan, or a promulgated (or proposed) Standard for that class or category of source. However, should a specific class or category not be addressed in any of the above, good engineering practice and accepted industry practices should be used in determining reasonable methods of capture or containment.

The R. Banks (BAQ)/B. Koplan (Trigon) letter dated August 3, 1995, addresses fugitive emissions for potential to emit calculations and provides greater detail on this subject. A reprinted copy of this letter follows below.

August 3, 1995

Barbara J. Koplan, P.E.
Project Manager
Trigon Engineering Consultants, Inc.
1200 Woodruff Road, Suite B-11
Greenville, SC 29607

RE: Requested guidance on fugitive emission determinations for calculating potential to emit

Dear Ms. Koplan:

This letter is in response to your July 26, 1995 letter requesting a policy decision on including “fugitive emissions” in calculating “potential to emit” for Part 70 purposes. Per S.C. Regulation 61-62.70.2.p, fugitive emissions are defined as “those emissions which could not reasonably pass through a stack, chimney, vent, or functionally-equivalent opening.” This definition should not be interpreted to mean those emissions that are not currently being routed to an “existing stack, chimney, vent, etc.” as proposed in your letter.

The above definition of fugitive emissions originated under Title I of the Act (i.e., PSD/NSR regulations), and will continue to be interpreted in the same manner. The permitting authority must decide on a case-by-case basis what is considered “reasonable” in order to determine which emissions meet the definition of fugitive emissions.

To make a determination on fugitive emissions, the permitting authority must examine the source category of the specific industry in question, as well as “similar pollutant-emitting activities in different source categories” (see attached EPA memorandum). Generally, if collection technology (e.g., stacks, vents, hoods, chimneys, etc.) is commonly used within the industry’s source category and is technically feasible, emissions from similar emission sources without collection technology in place should not be considered fugitive emissions and must be counted towards the facility’s potential to emit.

To assist you and your clients with identifying what is considered “reasonable”, please refer to the following examples provided by the EPA via recent guidance memorandums and other documents:

- 1) “Emissions from a rock crushing operation that could reasonably be equipped with a capture hood are not considered fugitive and would be included in the source’s potential to emit” [page A.16, EPA New Source Review Workshop Manual, 1990 Draft]

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Fugitive Emission Guidance

August 3, 1995

- 2) “VOC emissions, even if in relatively small quantities, coming from leaking valves inside a large furniture finishing plant, are typically captured and exhausted through the building ventilation system. They are, therefore, measurable and should be included in the potential to emit.” [page A.16, EPA New Source Review Workshop Manual, 1990 Draft]
- 3) “It may be unreasonable to expect that relatively small quantities of VOC emissions, caused by leaking valves at outside storage tanks of the large furniture finishing operation, could be captured and vented to a stack.” [page A.16, EPA New Source Review Workshop Manual, 1990 Draft]
- 4) “The use of collection technology by other landfill sources, whether or not subject to EPA’s proposed requirements or to State Implementation plan or permit requirement, creates a presumption that collection of emissions is reasonable at other similar sources. If such a system can reasonably be designed to collect the landfill gas emissions, then the emissions are not fugitive and should be considered in determining whether a major NSR permit is required.” [EPA memorandum, “Classification of Emissions from Landfills for NSR Applicability Purposes”, October 21, 1994,]

Please note that S.C. Regulation 61-62.70.3(d) requires major facilities to include all fugitive emissions in the permit application in the same manner as stack emissions. SCDHEC does not intend for facilities to identify each “window” or “door” as an individual emission point. However, an emission estimate for each fugitive emission source must be generated.

Sincerely,

Rhonda H. Banks, Manager
Clean Air Act Implementation Section
Bureau of Air Quality

Enclosure: October 21, 1994 EPA memorandum

cc: Matthew Kanesh, Brian Kistner, BAQ
ec: Permitting/Modeling/District/Emissions Inventory BAQ Staff